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XXV. *Extract of a Letter from Mr. Lexel to Dr. Morton.*
Dated Petersburg, June 14, 1774.

Redde, Mar. 16,
 1775. **A**S I propose to make some researches concerning the difference of the meridians of the principal Observatories of Europe, which I am persuaded can best be ascertained by the occultations of the fixed stars by the Moon; it would be of great service to me to be furnished with the observations that have been made, or that will be made, this year, of the occultations of α or of γ Tauri by the Moon. I beg, therefore, SIR, you will please to desire Mr. MASKELYNE to communicate them to me, towards the beginning of the next year, directed to Mr. EULER, secretary of our Academy. It would also be of great use to me to have the observation of the occultation of the Pleiades by the Moon the 15th of March, 1766, in case it has been taken at Greenwich.

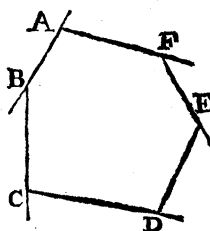
Here are some observations of Mr. Wargentín, of the occultations of α and γ Tauri.

1773, Nov.	1	11	56	12	Emerſion of α , uncertain to ſome ſeconds.
1774, Jan.	22	6	0	26½	Immerſion of the eye of γ , }
		7	15	51	Emerſion, } both very certain.
Feb.	18	6	39	51	Immerſion of γ , very certain.
		7	19	33	Emerſion, within two ſeconds.

The following are my obſervations.

1773, Nov.	1	12	56	47	{ Emerſion of α almoſt certain; the immerſion was not obſerved on account of clouds.
1774, Jan.	22	7	2	52	Immerſion, }
		8	20	44	Emerſion, } both certain.
April	14	8	28	34	Immerſion of α , very certain.
		9	3	20	Emerſion of the ſame.
	15	9	32	0	Immerſion of FLAMSTEAD'S 115 in γ .
	16	10	21	31	Immerſion of a ſtar of the 6th magnitude in π .
May	22	13	2	20	Immerſion of m Virginis, very certain.

I have lately diſcovered two curious theorems, which I ſhall here communicate to the Royal Society.



THEOREM.

Let A, B, C, D, E, F, be a polygon whoſe ſides are named a, b, c, d, e, f ; and the exterior angles $\alpha, \beta, \gamma, \delta, \epsilon, \zeta$, ſo that the ſide a be placed between the angles α and β , b between β, γ , &c.

$$1. \ a \times \sin. \alpha + b \times \sin. (\alpha + \beta) + c \times \sin. (\alpha + \beta + \gamma) + d \times \sin. (\alpha + \beta + \gamma + \delta) + e \times \sin. (\alpha + \beta + \gamma + \delta + \epsilon) + f \times \sin. (\alpha + \beta + \gamma + \delta + \epsilon + \zeta) = 0.$$

$$2. \frac{a \times \text{cofin. } a + b \times \text{cof. } (a + \beta) + c \times \text{cof. } (a + \beta + \gamma) + d \times \text{cof. } (a + \beta + \gamma + \delta)}{+ e \times \text{cof. } (a + \beta + \gamma + \delta + \epsilon) + f \times \text{cof. } (a + \beta + \gamma + \delta + \epsilon + \zeta)} = 0.$$

In fact it is $\sin. (a + \beta + \gamma + \delta + \epsilon + \zeta) = \sin. 360^\circ = 0$. and $\text{cof. } (a + \beta + \gamma + \delta + \epsilon + \zeta) = + 1$.; but in order to give the same form to the two expressions, I rather chose to represent them as I have done. By means of these two theorems the solution of polygons will be as easy as that of triangles by common trigonometry.